

# Long Island East End/Peconic Estuary Program: Nitrogen Management Challenge for Golf Courses

All information provided will remain confidential and only composite summary information will be made public.

If you have any questions or need assistance, please contact Dr. Marty Petrovic at 607-255-1796 or Dr. Jim Baird at 610-515-1660.

## Instructions

1. The management practices listed help to ensure that the goals of the Nitrogen Management Challenge are achieved. Review each management practice and determine whether it is in place at your golf course. Check your response: *Yes*, *Partially Implemented*, or *No* (A description of each response follows below). Don't labor on each statement. If you're unsure what something means, chances are good that a "Yes" response is not appropriate.
2. For each management practice that you check *Partially Implemented* or *No*, fill out the last column *Planned Efforts*. Thus, you will plan to incorporate environmental management practices that are not in place or need improvement. These will form the basis for your Nitrogen Management Plan.
3. The environmental management practices included here apply to almost all golf courses. However, we recognize that many courses have unique circumstances that prevent certain environmental management practices from being implemented. If you believe that a management practice is not applicable to your course, please state why in the space provided under *Planned Efforts*, or make a note at the end of the section. You may also attach additional sheets if needed.
4. A space for notes is provided at the end of the document. You may use this space to provide additional details that will help us understand your conservation efforts or to make notes that will help you implement your plan.

### A word of encouragement

If environmental management is new to you, you may find that you will respond "No" or "Partially Implemented" to many of the management practices listed in the Nitrogen Management Plan. Don't be discouraged. Remember, this is not a test. The Nitrogen Management Plan presents a full range of environmental management practices and serves as a way to identify your current strengths, as well as future priorities and areas for improvement.

## Responses

<b>YES</b>	Management practice is complete or ongoing. Management practice can be verified.
<b>PARTIAL</b> Partially Implemented	Management practice has been started, but needs further attention and improvement.
<b>NO</b>	Management practice is not in place.
<b>PLANNED EFFORTS</b>	If the management practice is only partially implemented or not yet begun, please fill out a projected date that you will start the project or management practice and the date that you anticipate completing the project. For management practices that will be ongoing, please indicate a start date and write "ongoing." If you believe that the management practice is not applicable to your course, <u>please state why</u> in the space provided.

**Comment [MSOffice1]:** This table is redundant with the information in the numbered list above – can we combine their information to make a single, concise page of information about responses for the environmental plan?

## Nitrogen Management Plan

**Purpose:** *To eliminate existing stresses and reduce future stress in the Peconic Estuary Region with respect to nitrogen inputs from golf courses.*

Environmental Management Practices	Yes	Partial	No	Planned Efforts Indicate <i>start date</i> and <i>completion date</i> or "ongoing" for projects that are only partially implemented or not yet begun. Explain practices that are not applicable here.
<b>Goal 1: Planning and Documentation</b> <i>To make a commitment to environmental stewardship, plan projects that ensure overall environmental quality, and evaluate progress toward achieving goals and objectives on a yearly basis. To document environmental efforts to track progress and assist with planning.</i>				
1. We have completed the Site Assessment Form.				
2. We have created a map of the golf course that illustrates areas in play, out of play (e.g., lawn, clubhouse), natural areas, buffers, water features, mature woodlands, wetlands, special habitat concerns, etc.				
3. We document fertilizer and pesticide use and evaluate progress toward goals and objectives <i>at least once per year</i> .				
4. We train all of our staff to understand that poor management practices may adversely impact worker health, on- and off-site water quality, groundwater, local soil health, and wildlife species and their habitats.				
5. We train all employees regarding the importance of environmental performance and specific techniques for ensuring environmental quality.				
6. We have baseline data for representative water bodies and water sources that may be adversely affected by golf course operations. Testing practices include: a.) If there is a creek/stream/river that flows through the golf course, water is tested where water enters and exits the property. b.) Physical characteristics: dissolved oxygen, pH, temperature, and specific conductivity. c.) Nutrients- nitrogen (nitrate and ammonia) and total phosphorus. d.) Macroinvertebrates- surveys for aquatic organisms to determine water quality in streams. e.) Baseline tests conducted 4x/year for at least a year. f.) Re-test water sources at least one time per year, or sooner if problems occur.				
<b>Goal 2: Cultural Practices and IPM Techniques</b> <i>To maintain turfgrass in a vigorous and healthy state through sound cultural practices and integrated pest management techniques.</i>				
7. We maintain green, tee, and fairway mowing heights at levels that can be reasonably maintained on a day-to-day basis without continually stressing turf or maximizing chemical and fertilizer inputs.				
8. We have inventoried soil types for all playing surfaces and assessed conditions such as soil structure, nutrient levels, organic content, compaction, and water infiltration.				
9. We regularly work to improve soil health. This may include: amending organic content, aerating, and improving water infiltration. We work to cultivate a diverse, living biotic soil community ( <i>i.e.</i> ,				

encourage soil microorganisms).			
<b>Environmental Management Practices</b>	<b>Yes</b>	<b>Partial</b>	<b>Planned Efforts</b> Indicate <i>start date</i> and <i>completion date</i> or “ <i>ongoing</i> ” for projects that are only partially implemented or not yet begun. Explain practices that are not applicable here.
10. Decisions regarding fertilizer applications are based upon soil and/or tissue testing and climatological information.			
11. We consider the environmental impact of fertilization, <i>e.g.</i> , leaching and runoff potential, toxicity to non-target organisms, soil absorption capacity, persistence, water solubility, effects on soil microorganisms.			
12. We maintain records of fertilizer applications <i>and their effectiveness</i> and use them to guide future fertilization decisions.			
<b>Goal 3: Best Management Practices for Chemical Use</b> <i>To apply all chemical products in a manner that minimizes harmful environmental impacts.</i>			
13. We train all of our key maintenance staff to recognize that chemical and fertilizer mixing, use, storage, and disposal may pose risks to human health and the environment.			
14. Pesticides and fertilizer are applied by a trained, licensed applicator or as directed by law.			
15. When using chemical products, staff always read and follow label directions.			
16. We strive to treat problems at the proper time and under the proper weather conditions to maximize effectiveness and minimize harmful environmental impacts.			
17. We employ practices and use products that reduce the potential for contamination of ground and surface water, <i>e.g.</i> , physical removal, spoon-feeding, slow-release products, selected natural organic products.			
18. We have eliminated potential chemical runoff and drift by avoiding applications during high winds or prior to heavy rains.			
19. Where practicable, we have established “no spray zones” and buffer areas, particularly around water features and other environmentally sensitive areas. We have communicated these areas via map or site tour to all staff that apply fertilizers or pesticides.			
<b>Goal 4: Maintenance Facility</b> <i>To ensure that chemicals are properly stored and handled, and equipment is properly maintained to reduce the potential for negative environmental impacts.</i>			
20. We meet all state and OSHA regulations that apply to storage, handling, and disposal of chemicals and fertilizer used on the property.			
21. We prevent gasoline, motor oil, brake and transmission fluid, solvents, and other chemicals used to operate and maintain equipment and vehicles from contaminating soils, surface waters, or ground water. If possible, we recycle the aforementioned chemicals.			

22. When cleaning and maintaining our equipment, water does not directly drain into surface water (i.e., lake, pond, stream).			
23. We properly store all chemicals. Pesticides and fertilizers are stored indoors or undercover on plastic or metal shelving to keep them off the floor. We store liquid products <i>below</i> dry materials.			
24. We handle all pesticides and fertilizer over an impermeable surface. A spill containment kit is readily available and spill containment procedures are in place.			
<b>Environmental Management Practices</b>	<b>Yes</b>	<b>Partial</b>	<b>Planned Efforts</b> Indicate <i>start date</i> and <i>completion date</i> or " <i>ongoing</i> " for projects that are only partially implemented or not yet begun. Explain practices that are not applicable here.
25. An annual survey is conducted to identify unneeded and unwanted fertilizer. These materials are disposed of properly.			
26. Grass clippings are blown off equipment with compressed air instead of, or prior to, washing with water.			
27. A catch basin to collect grass clippings, grease, and oils is installed and maintained.			
<b>Goal 5: Water Conservation: Irrigation Equipment and Plumbing Fixtures</b> <i>To maintain irrigation equipment for maximum efficiency and minimal water waste.</i>			
28. We train our employees to conserve water and make water conservation a priority in our management approach.			
29. Our irrigation system is properly designed, correctly installed, and performance has been tested.			
30. We check our irrigation system for proper water distribution in all irrigated areas at least once per year.			
31. We adjust rotation speed and operating pressure to match sprinkler spacing to nozzle performance.			
32. We have eliminated all non-target watering (e.g., side walks, ponds, habitat areas).			
33. Our pump station is regularly maintained and is working efficiently.			
34. We have upgraded our irrigation system, or components of our system (e.g., valves, sprinkler heads, nozzles, computer software), to reduce inefficiency and malfunction and reduce water use.			
35. We have installed part-circle irrigation heads where possible to save water.			
<b>Goal 6: Water Conservation: Watering Practices and Turf Care</b> <i>To implement water conservation practices. To maintain soil and turf health that maximizes water absorption and minimizes water loss to evaporation and runoff.</i>			

36. We incorporate evapotranspiration rates or weather data into our daily irrigation decisions.			
37. We have reduced or eliminated irrigation on all unused or minimally used portions of the property.			
38. We work to maintain an effective water cycle to maximize water absorption and reduce runoff and evaporation, including: maintaining soil cover, improving soil structure, adding or maintaining natural organic matter in the soil, and improving drainage to minimize runoff and maximize water penetration through soil layers.			
<b>Environmental Management Practices</b>	<b>Yes</b>	<b>Partial</b>	<b>No</b>
			<b>Planned Efforts</b> Indicate <i>start date</i> and <i>completion date</i> or “ongoing” for projects that are only partially implemented or not yet begun. Explain practices that are not applicable here.
39. We monitor daily water use, tally monthly usage, and set targets for yearly improvement.			
<b>Goal 7: Best Management Practices (BMP) for Protecting Water Quality</b> <i>To employ best management practices or structural controls near all water bodies to eliminate the potential for chemical runoff, nutrient loading, erosion, and drift.</i>			
40. We visually monitor water bodies for water quality problems, such as erosion, algae, aquatic “weed” growth, fish kills, sediment buildup, etc., as part of regular IPM scouting activities.			
41. We report water quality problems immediately to supervisors and, if required, regulatory agencies for appropriate action.			
42. All of our key maintenance staff ( <i>e.g., superintendent, assistant superintendent, crew foreman, irrigation technician, chemical spray technician</i> ) are able to identify the specific <b>watershed</b> and subwatershed in which the property is located.			
43. All of our key maintenance staff are able to identify where wastewater and surface runoff go after leaving the property.			
44. We have eliminated/mitigated erosion to water bodies such as streams, lakes, and ponds.			
45. Where practicable, we employ more environmentally-sensitive plant management techniques within 25-feet of all wetlands, water bodies, and well heads to eliminate or minimize nutrient and chemical inputs.			
46. We prevent fertilizers, pesticides, lawn clippings, soil and other landscaping materials from collecting on and running off impervious surfaces.			
47. If grass clippings are not returned to turf, we manage them in a manner that protects surface and ground water quality.			
48. Where practicable, we have eliminated potential chemical runoff and drift near all water bodies by designating “no spray” zones, using spot treatments, increasing thresholds for pest problems, using covered booms, and taking the weather into account prior to application.			

**Comment [MSOffice2]:** Is there any need to identify on what level we expect this knowledge? How large or small a watershed? I.e. The onesquethaw vs. the Hudson.

49. Where shorelines are in play and it is practicable, we raise the mowing height along the water's edge to slow and filter runoff. (Research has shown that, on a slight slope, a 25- foot buffer of 3- inch turf is sufficient.)				<b>Comment [MSOffice3]:</b> We should use a star and identify the actual source(s) of the research.
50. We reduce the potential for nutrient loading to water bodies, such as streams, lakes, and ponds, by employing BMPs such as: using slow-release fertilizers, spoon-feeding, filtering drainage through vegetative or mechanical filters prior to entering water bodies, etc.				
51. We calibrate and adjust fertilizer and pesticide equipment to prevent misapplication.				
52. Where practicable, we have eliminated or reduced application of nitrogen on out-of-play areas.				
53. We employ the use of plant growth regulators in order to maximize nitrogen use efficiency.				
<b>Environmental Management Practices</b>	<b>Yes</b>	<b>Partial</b>	<b>No</b>	<b>Planned Efforts</b> Indicate <i>start date</i> and <i>completion date</i> or " <i>ongoing</i> " for projects that are only partially implemented or not yet begun. Explain practices that are not applicable here.
54. We maintain and clean maintenance equipment in a manner that eliminates the potential for on- site or off-site contamination of water bodies.				
55. We handle and apply fertilizers, pesticides, and other chemicals in a manner that eliminates potential on-site or off-site contamination of water bodies.				
56. We dispose of all chemical containers and all excess waste materials in a manner that eliminates the potential for on-site or off-site contamination of water bodies.				
57. We reduce/eliminate the need for chemical algae control in ponds through nutrient reduction, proper aeration, bio-filters, vegetation management, or bio-controls.				
<i>Person(s) responsible for overseeing Environmental Planning efforts- please list name(s):</i>				

**Notes:**

## Environmental Management Plan (OPTIONAL)

**Purpose:** *To balance the demands of golf with our responsibility to the natural environment . To safeguard the quality of the environment, and responsibly care for the water, land, and wildlife habitats upon which our course is sustained.*

Environmental Management Practices	Yes	Partial	No	Planned Efforts <small>Indicate start date and completion date or "ongoing" for projects that are only partially implemented or not yet begun. Explain practices that are not applicable here.</small>
<b>Goal 2: Cultural Practices and IPM Techniques</b> <i>To maintain turfgrass in a vigorous and healthy state through sound cultural practices and integrated pest management techniques.</i>				
58. We train all of our key maintenance staff in the basic tenets of integrated pest management, including: (1) scouting and monitoring; (2) selecting thresholds; (3) making decisions based on treatment options; (4) proper timing and spot treatment; (5) documenting and evaluating results.				
59. We regularly train and encourage continuing education for maintenance staff, including state licensing, professional association training, and IPM certification. <i>If applicable</i> , we provide non-English speaking employees with training in their native languages.				
60. We communicate with employees and clientele regarding our IPM program to maintain a dialogue regarding thresholds, epidemics, and control measures in relation to environmental quality.				
61. We communicate with the green committee, club manager, and club pro, as appropriate, to coordinate and assure support for needed environmental enhancements.				
62. We strive to maximize turf health and minimize resource inputs by improving turf conditions.				
63. We plant more pest -resistant or stress-tolerant cultivars on playing surfaces and in landscaping. We select plant species/cultivars best suited for our climate				
64. We have designated and trained scouts to monitor plant health and pest populations as part of our IPM program.				
65. We have identified and recorded turf "hot spots" where disease or insect outbreaks routinely occur first. We have also identified other areas where poor growing conditions often lead to problems.				
66. We use scouting forms to record the type, severity, location, and treatment of pest problems.  67. We evaluate potential control measures, including alterations in cultural management, biological, physical, and mechanical controls, and chemical methods.				
68. We actively work to reduce turf stresses and improve cultural practices or other conditions to prevent or discourage recurrence of problems.				
<b>Goal 3: Best Management Practices for Chemical Use</b> <i>To apply all chemical products in a manner that minimizes harmful environmental impacts.</i>				

69. We maintain a current MSD S (Material Safety Data Sheet) for each chemical at our facility.			
<b>Environmental Management Practices</b>	<b>Yes</b>	<b>Partial</b>	<b>Planned Efforts</b> Indicate <i>start date</i> and <i>completion date</i> or "ongoing" for projects that are only partially implemented or not yet begun. Explain practices that are not applicable here.
70. We apply pesticides only when and where scouting indicates that pest threshold levels have been exceeded.			
<b>Goal 4: Maintenance Facility</b> <i>To ensure that chemicals are properly stored and handled, and equipment is properly maintained to reduce the potential for negative environmental impacts.</i>			
71. Our chemical storage structure is secure and well-ventilated. Personnel access is limited.			
72. We organize our maintenance facility for efficient and proper storage of equipment and supplies.			
73. Fuel is stored on an impervious surface that has spill containment and a roof.			
74. Chemical storage structure is fire proof.			
75. Explosion proof lights are used in chemical storage and maintenance areas.			
76. Chemical storage area has a sealed metal or concrete floor, and spills are contained by a sump located near the middle of the floor, and a lip along the edges.			
77. An annual survey is conducted to identify unneeded and unwanted chemicals (including banned pesticides). These materials are disposed of properly.			
<b>Goal 5: Water Conservation: Irrigation Equipment and Plumbing Fixtures</b> <i>To maintain irrigation equipment for maximum efficiency and minimal water waste.</i>			
78. All of our key maintenance staff are able to identify the water sources used for irrigation and drinking water.			
79. Our course superintendent and irrigation technicians have been trained and know how to correctly operate and manage the irrigation system.			
80. We check all irrigation equipment daily and regularly maintain the system on a regular schedule.			
81. We fix leaks in a timely manner.			
<b>Goal 6: Water Conservation: Watering Practices and Turf Care</b> <i>To implement water conservation practices. To maintain soil and turf health that maximizes water absorption and minimizes water loss to evaporation and runoff.</i>			



82. We avoid running our irrigation system at peak evapotranspiration times.			
83. We water “hot spots” to target needed areas only, rather than running the entire irrigation system during the peak of the day.			
<b>Environmental Management Practices</b>	<b>Yes</b>	<b>Partial</b>	<b>Planned Efforts</b> Indicate <i>start date</i> and <i>completion date</i> or “ <i>ongoing</i> ” for projects that are only partially implemented or not yet begun. Explain practices that are not applicable here.
84. The turf grass on our greens, tees, and fairways is appropriate for our local climate and growing conditions.			
<b>Goal 7: Best Management Practices (BMP) for Protecting Water Quality</b> <i>To employ best management practices or structural controls near all water bodies to eliminate the potential for chemical runoff, nutrient loading, erosion, and drift.</i>			
85. When aquatic weed management is required, we seek a physical solution (e.g., hand removal of plants) first, and then seek the least toxic method of chemical weed control. We also address any underlying causes of the problem.			
Person(s) responsible for overseeing Environmental Planning efforts- please list name(s):			

**Notes:**